Dept. of Computer Science and Engineering (Data Science)

Adichunchanagiri Institute of Technology, Chikkamagaluru

Mini Project Synopsis

TITLE: Medicinal Leaf Name Detection Using Image Processing Techniques

Problem Statement: The identification of medicinal leaves plays an important role in herbal medicine, traditional healing practices, and biodiversity conservation. Manual identification is time-consuming and can lead to errors due to similarities between leaves. There is a need for an automated system that uses image processing techniques to analyze and identify medicinal leaves, providing a simpler method for recognizing different types of leaves without the complexity of machine learning models.

Description: This project aims to create a system that detects and identifies medicinal leaves using image processing techniques without relying on machine learning. The approach involves capturing images of medicinal leaves and pre-processing them to improve clarity and extract key features like shape, color, edge patterns, and texture. Key methods include image segmentation, contour detection, edge detection, and pattern matching. By comparing these features against a pre-defined database of medicinal leaves, the system can identify and display the names of the leaves. This approach is suitable for situations where machine learning resources are unavailable or when a simpler solution is preferred.

Expected Outcomes:

- Creation of a reference database containing images and characteristics of common medicinal leaves.
- A software application where users can upload an image of a leaf and receive the detected name based on feature analysis.
- Potential applications in herbal medicine, educational tools, and simple field studies.

Technologies and Tools:

- Programming Language: Python
- Libraries: OpenCV (for image processing), NumPy (for numerical operations)
- Image Processing Techniques: Edge Detection (e.g., Canny Edge Detection), Contour Detection, Color Analysis (e.g., HSV color space), Shape Matching (e.g., Hu Moments)
- Database: A collection of reference images of medicinal leaves and their extracted feature values using Mongo db.
- Hardware: Camera or smartphone for capturing leaf images, and a computer for processing.
- Software: Jupyter Notebook or Visual studio code

Team Members:

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Signature of the Guide with date **Signature of the Coordinator with date**